species recorded sparingly from a few localities, but off Redcar it occasionally appears in extraordinary shoals in springtime. Such visitations have occurred previously in the second week of February, 1892, April, 1907, and April 2, 1908. In general the creatures come ashore after a N. or N.E. wind, but on the present occasion a gentle westerly wind had prevailed for a few days. I should be glad to receive information from naturalists or fishermen who may have observed these minute "shrimps" about the same date, on other parts of the coast or in the open sea, so that knowledge may be gained of the full extent and of the provenance of the shoal.

James Ritchie.

Royal Scottish Museum, Edinburgh.

New Zealand Vegetation.

In Nature for April 10 (p. 147), under the title "New Zealand Vegetation," I notice the following sentence :—"The northern rivers and estuaries display a mangrove vegetation—a unique and unexpected occurrence outside of the tropics."

The writer of the article is evidently not aware that mangrove formations are found at intervals all round the coasts of Australia. The species which forms them is *Avicennia officinalis,* L., which occurs in all the Australian States, but not in Tasmania. It reaches its southerly limit in Western Australia in the neighbourhood of Bunbury (33½° S.), where the trees reach a height of about 12 ft. On the east coast it is most familiar on the shores of the Parramatta River in Sydney Harbour, which is a little further south than Bunbury, but it occurs so far south as Corner Inlet, on the east side of Wilson's Promontory (39° S.). This southernmost point of the Australian continent is one degree further south than any point on the north coast of the North Island of New Zealand.

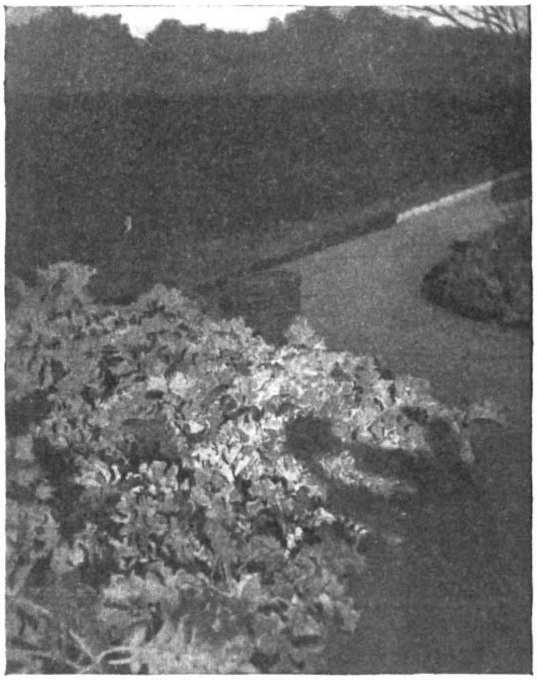
W. B. Alexander.

The Western Australian Museum and Art Gallery,
Perth, Western Australia, May 10.

I fear that in attempting to compress into a few paragraphs a general sketch of the plant communities of New Zealand I inadvertently conveyed the erroneous impression concerning the distribution of the mangrove vegetation in Australasia which Mr. W. B. Alexander has corrected in his interesting note. The sentence which he quotes is perhaps less misleading if read in connection with that immediately preceding it, and containing the statement upon which I wished to lay chief stress in enumerating the main types of New Zealand vegetation—"to find an equal variety a continent extending to the tropics would have to be visited." I was quite aware of the well-known fact that the eastern or Indo-Malayan mangrove flora, well developed on the northern littoral of Australia, extends in an impoverished form along the eastern and western coasts southwards, though it is interesting to note that it actually reaches the most southerly point of the Australian continent. It may be added that Prof. Bews (Annals Natal Museum, ii., 1912, p. 297) has recently described what appears to be the most southerly extension of the mangrove vegetation on the opposite side of the Indian Ocean, in Durban Bay; here, as in the subtropical and warm temperate parts of Australasia, the rich eastern mangrove flora is represented by an interesting though poorly developed outlier consisting of *Avicennia officinalis, Bruguiera gymnorhiza,* and *Rhizophora mucronata.* F. C.

Anthelia.

In connection with the correspondence in Nature on the bright light on dew round the shadow of one's head, the accompanying photograph, which shows the phenomenon on dew on seakale, may be of interest. It was taken here on October 7, 1899, at 8.35 a.m. It shows the shadow of the camera, so that in spite of the irregularity of the leaves the radius of the bright light is easily measured as nearly 8°. The scale of the photograph is 8·5° to the inch.



T. W. Backhouse.

West Hendon House, Sunderland, June 10.

Antennæ for Wireless Telegraphy.

I was interested to see Mr. Campbell Swinton's letter on wireless receiving with his bedstead as an aërial. Many of the more powerful stations are, however, much easier to receive than is generally supposed; for instance, I have been able to read the Eiffel Tower nine o'clock news message with only 12 ft. of No. 18 S.W.G. copper wire stretched across my attic (second floor, about 25 ft. from the ground) using good earth to waterpipes, with usual tuning coils and condensers, bornite-zincite detector, and very sensitive 4000 ohm telephone (H. W. Sullivan), without any relay. Even when the aërial was reduced to 6 ft. of wire the signals were just audible, but very faint. Arnold G. Hansard.

Limpsfield, Surrey, June 10.

Some months ago, in endeavouring to reduce the antenna to the smallest possible dimensions, such as by placing a series of wires just over the instruments, I found that by using a bedstead (without wire mattress) signals of "strength 8"—*i.e.* moderately loud—could easily be obtained from Paris *without the aid of a Brown relay*—a costly instrument, reputed to increase the strength of signals five times. The apparatus used was simply the orthodox loose coupling with crystal detector. The bed used is on the second floor of my house, about 20 ft. from the ground, and the gas-pipe below the same floor served as an earth connection.

Under the same conditions Norddeich is usually readable, and sometimes Poldhu and Nauen. That nearer stations are also heard is obvious.

I should be pleased to give a demonstration of

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reception by means of this same bedstead as the antenna to anyone interested.

BENJAMIN S. T. WALLACE.

113 St. James Road, Upper Tooting,
London, S.W., June 16.

Sub-Red Crag Flint Implements and the Ipswich Skeleton.

I WOULD like Mr. Sutcliffe to read p. 199 of vol. i., part ii., Proceedings East Anglian Prehistoric Society, which contains the original description of the discovery of the Ipswich man. I think it would have been better if he had done this before publicly accusing me of inconsistency in regard to this matter.

J. REID MOIR.

THE OXYGEN CONTENT OF THE ATMOSPHERE.[1]

THIS memoir, published under the auspices of the Carnegie Institution of Washington, is of a type with which we are becoming increasingly familiar—a publication, in fact, which, it may be argued, the institution was created largely to undertake. None of the regularly constituted scientific societies would probably charge themselves with the issue of such a work, and it is very unlikely that it would see the light if left to private enterprise. Nevertheless, it is an eminently useful work, and will be welcomed by chemists, meteorologists, and physiologists alike.

The work is divided into two parts. Part i. is wholly concerned with an historical account of the development of the methods for determining oxygen, in which practically everything contained in the literature has been put together and collated, from the days of Scheele and Priestley to those of Regnault and Bunsen, von Jolly and Morley, down to the methods of our own time depending upon purely absorptiometric processes. Naturally there is nothing very original in this section, and it is well-trodden ground to all who are familiar with the development of eudiometry. It is, however, an interesting and useful compilation, and will be of service to those who are concerned with accurate gasometric analysis, especially in relation to the atmosphere, or who desire to know all there is to know relating to its history.

The second and more immediately important part deals with the experimental work of the nutrition laboratory of the Carnegie Institution, Washington, of which Prof. Benedict is the director.

For some time past the nutrition laboratory has been engaged, among other things, in an elaborate inquiry into the nature of respiratory exchange in relation to metabolic processes, and the necessary instrumental equipment has now been brought to a very high degree of precision. After a careful investigation into the merits of the various types of modern absorptiometric apparatus, it was decided that the arrangement devised by Dr. Klas Sondén, of Stockholm, a development of the apparatus originally contrived some years ago by Prof. Pettersson, more fully fulfilled the essential conditions of expedition, convenience and accuracy than any other existing form; and part ii. is practically made up of a description of the Sondén air-analysis apparatus, illustrated by photographs and woodcuts, together with an account of the plan and methods of research to be undertaken by it, with the results which have been obtained up to the date of publication of the report.

The principle of the apparatus is essentially that of the original Pettersson instrument, in which the absorption and determination of the carbon dioxide and oxygen are made, as in the Hempel, Orsat, and Haldane arrangments, by means of caustic potash and alkaline pyrogallate, but with the use of water-jackets and compensating pipettes so as to ensure much greater accuracy of reading.

The plan of the research involved (1) the estimation of the comparative oxygen-content of uncontaminated outdoor air under all conditions as to wind direction and strength, temperature, cloud formation, barometer and weather, including rain, snow, fog and mist; (2) a study of the influence of the temperature of the reagent upon its absorptive power; (3) an examination of the air over the North Atlantic Ocean; (4) on the summit of Pike's Peak; (5) in the crowded streets of Boston and in the subways of New York and Boston.

Such a programme necessitated a very large amount of experimental work and the analysis of many hundred samples of air. In addition, a large volume of work was needed in control and verification, and especially in tracking down and eliminating sources of possible error. Eventually a routine method was established, and from a long series of determinations it would appear that, as regards oxygen content of outdoor air, no material fluctuation could be detected over a period extending from April, 1911, to January, 1912. This constancy was maintained in spite of all possible alteration in weather conditions, barometric or thermometric changes, or changes in humidity, wind direction, and strength; furthermore, the experiments were made before, during, and after the vegetative season. The average result of 212 analyses showed 0·031 per cent. of carbon dioxide and 20·952 per cent (corrected) of oxygen. Hence Dr. Benedict concludes "that air is a physical mixture with the definiteness of composition of a chemical compound." We have, in fact, got back to the position maintained by Cavendish in 1783 and by de Marli in 1787, that is, of the uniform constancy of the composition of normal atmospheric air, so far as regards its oxygen content.

Prof. Benedict further concludes that—

> While the combustion of fuel and the vital processes of men and animals result in a local increase in carbon dioxide and decrease in oxygen on the one hand, and vegetable growth results in a decrease in carbon dioxide and increase in oxygen on the other, the extraordinary rapidity with which the local variations in the composition of the air are equalised is accentuated by the observations on street air, which show but the slightest trace of an oxygen deficit.

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[1] The Composition of the Atmosphere, with Special Reference to its Oxygen Content." By F. G. Benedict. Pp. iii+115. (Washington, D.C.: arnegie Institution of Washington, 1912.)

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